lets say i want to configure goldengate from one source to 3 target databases, each db having same schema with same table (scott.emp)

Source

======

platform: Windows

GG\_HOME : C:\App\oracle\product\gg

Ogg user : ogg\_windows

db\_name=proddb

schema=scott

table=emp

Target

======

platform: Linux

GG\_HOME : /u01/app/oracle/product/gg

Ogg user : ogg\_linux

db\_name=KRUPA

schema=scott

table=emp

Target

======

platform: Linux

GG\_HOME : /u01/app/oracle/product/gg

Ogg user : ogg\_linux

db\_name=suresh

schema=scott

table=emp

Target

======

platform: Linux

GG\_HOME : /u01/app/oracle/product/gg

Ogg user : ogg\_linux

db\_name=mahesh

schema=scott

table=emp

===========================================================================

Oracle GoldenGate: One Source to Three Targets Replication

This document outlines the steps to configure Oracle GoldenGate to replicate data from a single source database on Windows to three separate target databases on Linux, all replicating the scott.emp table.

1. Prerequisites and Assumptions

Before you begin, ensure the following:

GoldenGate Software Installed: Oracle GoldenGate 21c (or a compatible version) is installed on both the Windows source server and all three Linux target servers at the specified GG\_HOME paths.

Database Connectivity: Network connectivity exists between the source server and all target servers, allowing TNS connections.

Oracle Databases Running: All source (proddb) and target (KRUPA, suresh, mahesh) Oracle databases are up and running.

scott Schema: The scott schema with the emp table exists and is identical in structure on all four databases.

Disk Space: Sufficient disk space is available for GoldenGate trails and checkpoints.

Firewall Rules: Any firewalls are configured to allow communication on the GoldenGate Manager port (default 7809).

2. Source Database Preparation (Windows - proddb)

2.1 Database Configuration

Enable Archivelog Mode:

GoldenGate requires the database to be in ARCHIVELOG mode to capture changes.

-- Connect as SYSDBA

SQL> SELECT LOG\_MODE FROM V$DATABASE;

-- If not ARCHIVELOG, proceed with:

SQL> SHUTDOWN IMMEDIATE;

SQL> STARTUP MOUNT;

SQL> ALTER DATABASE ARCHIVELOG;

SQL> ALTER DATABASE OPEN;

Enable Supplemental Logging:

This ensures that GoldenGate captures all necessary information for replication, including primary key and unique key columns.

-- Connect as SYSDBA

SQL> ALTER DATABASE ADD SUPPLEMENTAL LOG DATA; -- Database-level minimal supplemental logging

SQL> ALTER DATABASE ADD SUPPLEMENTAL LOG DATA (PRIMARY KEY, UNIQUE INDEX) COLUMNS; -- Recommended for DML operations

2.2 GoldenGate User Creation and Grants

Create the GoldenGate user ogg\_windows in the source database and grant necessary privileges.

-- Connect as SYSDBA

SQL> CREATE USER ogg\_windows IDENTIFIED BY YourStrongPassword DEFAULT TABLESPACE USERS TEMPORARY TABLESPACE TEMP;

SQL> GRANT CONNECT, RESOURCE TO ogg\_windows;

SQL> GRANT SELECT ANY DICTIONARY TO ogg\_windows;

SQL> GRANT UNLIMITED TABLESPACE TO ogg\_windows;

SQL> GRANT ALTER ANY TABLE TO ogg\_windows;

SQL> GRANT FLASHBACK ANY TABLE TO ogg\_windows;

SQL> GRANT SELECT ANY TABLE TO ogg\_windows;

SQL> GRANT CREATE SESSION TO ogg\_windows;

SQL> GRANT ALTER SYSTEM TO ogg\_windows;

SQL> GRANT CREATE TABLE TO ogg\_windows;

SQL> GRANT DROP ANY TABLE TO ogg\_windows;

SQL> GRANT CREATE SEQUENCE TO ogg\_windows;

SQL> GRANT ALTER ANY SEQUENCE TO ogg\_windows;

SQL> GRANT EXECUTE ON DBMS\_LOCK TO ogg\_windows;

SQL> GRANT SELECT on V\_$ARCHIVED\_LOG to ogg\_windows; -- For integrated extract

SQL> GRANT SELECT on V\_$LOGMNR\_CONTENTS to ogg\_windows; -- For integrated extract

SQL> GRANT EXECUTE ON DBMS\_FLASHBACK TO ogg\_windows;

SQL> GRANT EXECUTE ON UTL\_FILE TO ogg\_windows; -- If using UTL\_FILE

SQL> GRANT ALTER SESSION TO ogg\_windows;

SQL> GRANT MERGE ANY VIEW TO ogg\_windows;

SQL> GRANT GLOBAL QUERY REWRITE TO ogg\_windows;

SQL> GRANT SELECT ANY TRANSACTION TO ogg\_windows;

SQL> GRANT SELECT ANY SEQUENCE TO ogg\_windows;

-- For integrated extract, also grant:

SQL> GRANT CAPTURE\_ADMIN TO ogg\_windows;

-- If using Classic Extract (not recommended for new setups with 12c+ DB):

-- SQL> GRANT SELECT\_CATALOG\_ROLE TO ogg\_windows;

-- SQL> GRANT EXECUTE ON SYS.DBMS\_LOGMNR TO ogg\_windows;

-- SQL> GRANT SELECT ON V\_$DATABASE TO ogg\_windows;

-- SQL> GRANT SELECT ON V\_$ARCHIVED\_LOG TO ogg\_windows;

-- SQL> GRANT SELECT ON V\_$LOGMNR\_CONTENTS TO ogg\_windows;

-- SQL> GRANT SELECT ON V\_$TRANSACTION TO ogg\_windows;

-- SQL> GRANT SELECT ON SYS.GV\_$ARCHIVED\_LOG TO ogg\_windows;

-- SQL> GRANT SELECT ON SYS.GV\_$LOGMNR\_CONTENTS TO ogg\_windows;

-- SQL> GRANT SELECT ON SYS.GV\_$TRANSACTION TO ogg\_windows;

2.3 GoldenGate Manager Process (Source)

Navigate to the GoldenGate home on Windows: C:\App\oracle\product\gg

Start the GGSCI command prompt:

cd C:\App\oracle\product\gg

ggsci

In GGSCI:

GGSCI> EDIT PARAMS MGR

Add the following lines to mgr.prm:

PORT 7809

DYNAMICPORTLIST 7810-7820

AUTORESTART EXTRACT \*, RETRIES 5, WAITMINUTES 3, RESETMINUTES 60

AUTORESTART REPLICAT \*, RETRIES 5, WAITMINUTES 3, RESETMINUTES 60

PURGEOLDEXTRACTS C:\App\oracle\product\gg\dirdat\\*, USECHECKPOINTS, MINKEEPALL 2h, MAXDAYS 5

Save and exit.

GGSCI> START MGR

GGSCI> INFO MGR

2.4 GoldenGate Extract Process (Source)

This will be an Integrated Extract.

GGSCI> ADD EXTRACT EXTPRODDB, INTEGRATED TRANLOG, BEGIN NOW

GGSCI> EDIT PARAMS EXTPRODDB

Add the following lines to extproddb.prm:

EXTRACT EXTPRODDB

SETENV (ORACLE\_SID=proddb)

USERID ogg\_windows, PASSWORD YourStrongPassword

DBOPTIONS DISABLETRG

TRANLOGOPTIONS DBLOGREADER

EXTTRAIL C:\App\oracle\product\gg\dirdat\lt

TABLE SCOTT.EMP;

Save and exit.

2.5 GoldenGate Data Pump (Source)

You will need a Data Pump for each target. This allows you to fan out the changes.

Data Pump for KRUPA:

GGSCI> ADD EXTRACT PUMPKRUPA, EXTTRAILSOURCE C:\App\oracle\product\gg\dirdat\lt

GGSCI> EDIT PARAMS PUMPKRUPA

Add the following lines to pumpkrupa.prm:

EXTRACT PUMPKRUPA

PASSTHRU

RMTHOST <IP\_OF\_KRUPA\_SERVER>, MGRPORT 7809

RMTTRAIL /u01/app/oracle/product/gg/dirdat/rk

TABLE SCOTT.EMP;

Save and exit.

Data Pump for SURESH:

GGSCI> ADD EXTRACT PUMPSURESH, EXTTRAILSOURCE C:\App\oracle\product\gg\dirdat\lt

GGSCI> EDIT PARAMS PUMPSURESH

Add the following lines to pumpsuresh.prm:

EXTRACT PUMPSURESH

PASSTHRU

RMTHOST <IP\_OF\_SURESH\_SERVER>, MGRPORT 7809

RMTTRAIL /u01/app/oracle/product/gg/dirdat/rs

TABLE SCOTT.EMP;

Save and exit.

Data Pump for MAHESH:

GGSCI> ADD EXTRACT PUMPMAHESH, EXTTRAILSOURCE C:\App\oracle\product\gg\dirdat\lt

GGSCI> EDIT PARAMS PUMPMAHESH

Add the following lines to pumpmahesh.prm:

EXTRACT PUMPMAHESH

PASSTHRU

RMTHOST <IP\_OF\_MAHESH\_SERVER>, MGRPORT 7809

RMTTRAIL /u01/app/oracle/product/gg/dirdat/rm

TABLE SCOTT.EMP;

Save and exit.

2.6 Register Extract and Add Trails

GGSCI> REGISTER EXTRACT EXTPRODDB DATABASE

GGSCI> ADD EXTTRAIL C:\App\oracle\product\gg\dirdat\lt, EXTRACT EXTPRODDB, MEGABYTES 50

GGSCI> ADD RMTTRAIL /u01/app/oracle/product/gg/dirdat/rk, EXTRACT PUMPKRUPA, MEGABYTES 50

GGSCI> ADD RMTTRAIL /u01/app/oracle/product/gg/dirdat/rs, EXTRACT PUMPSURESH, MEGABYTES 50

GGSCI> ADD RMTTRAIL /u01/app/oracle/product/gg/dirdat/rm, EXTRACT PUMPMAHESH, MEGABYTES 50

3. Target Database Preparation (Linux - for each target)

Repeat the following steps for each target database: KRUPA, suresh, mahesh.

3.1 Database Configuration

Enable Supplemental Logging (Optional, but good practice for target):

While primarily for source, if you ever plan to use these databases as sources or have complex replication scenarios, it's good practice.

-- Connect as SYSDBA

SQL> ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;

SQL> ALTER DATABASE ADD SUPPLEMENTAL LOG DATA (PRIMARY KEY, UNIQUE INDEX) COLUMNS;

3.2 GoldenGate User Creation and Grants

Create the GoldenGate user ogg\_linux in each target database and grant necessary privileges.

-- Connect as SYSDBA

SQL> CREATE USER ogg\_linux IDENTIFIED BY YourStrongPassword DEFAULT TABLESPACE USERS TEMPORARY TABLESPACE TEMP;

SQL> GRANT CONNECT, RESOURCE TO ogg\_linux;

SQL> GRANT UNLIMITED TABLESPACE TO ogg\_linux;

SQL> GRANT ALTER ANY TABLE TO ogg\_linux;

SQL> GRANT FLASHBACK ANY TABLE TO ogg\_linux;

SQL> GRANT SELECT ANY TABLE TO ogg\_linux;

SQL> GRANT INSERT ANY TABLE TO ogg\_linux;

SQL> GRANT UPDATE ANY TABLE TO ogg\_linux;

SQL> GRANT DELETE ANY TABLE TO ogg\_linux;

SQL> GRANT CREATE SESSION TO ogg\_linux;

SQL> GRANT ALTER SYSTEM TO ogg\_linux;

SQL> GRANT CREATE TABLE TO ogg\_linux;

SQL> GRANT DROP ANY TABLE TO ogg\_linux;

SQL> GRANT CREATE SEQUENCE TO ogg\_linux;

SQL> GRANT ALTER ANY SEQUENCE TO ogg\_linux;

SQL> GRANT EXECUTE ON DBMS\_LOCK TO ogg\_linux;

SQL> GRANT MERGE ANY VIEW TO ogg\_linux;

SQL> GRANT SELECT ANY TRANSACTION TO ogg\_linux;

-- For integrated replicat, also grant:

SQL> GRANT IMP\_FULL\_DATABASE TO ogg\_linux; -- For initial load using GoldenGate

SQL> GRANT GG\_ADMIN TO ogg\_linux; -- If using GG 21c and later

-- Or for prior versions:

-- SQL> GRANT AQ\_ADMINISTRATOR\_ROLE TO ogg\_linux;

-- SQL> GRANT EXECUTE ON DBMS\_AQADM TO ogg\_linux;

-- SQL> GRANT EXECUTE ON DBMS\_AQ TO ogg\_linux;

3.3 GoldenGate Manager Process (Target - for each)

Navigate to the GoldenGate home on Linux: /u01/app/oracle/product/gg

Start the GGSCI command prompt:

cd /u01/app/oracle/product/gg

ggsci

In GGSCI:

GGSCI> EDIT PARAMS MGR

Add the following lines to mgr.prm:

PORT 7809

DYNAMICPORTLIST 7810-7820

AUTORESTART REPLICAT \*, RETRIES 5, WAITMINUTES 3, RESETMINUTES 60

PURGEOLDEXTRACTS /u01/app/oracle/product/gg/dirdat/\*, USECHECKPOINTS, MINKEEPALL 2h, MAXDAYS 5

Save and exit.

GGSCI> START MGR

GGSCI> INFO MGR

3.4 GoldenGate Replicat Process (Target - for each)

Target: KRUPA

GGSCI> ADD REPLICAT REPKRUPA, INTEGRATED, EXTTRAIL /u01/app/oracle/product/gg/dirdat/rk

GGSCI> EDIT PARAMS REPKRUPA

Add the following lines to repkrupa.prm:

REPLICAT REPKRUPA

SETENV (ORACLE\_SID=KRUPA)

USERID ogg\_linux, PASSWORD YourStrongPassword

ASSUMETARGETDEFS

MAP SCOTT.EMP, TARGET SCOTT.EMP;

Save and exit.

Target: SURESH

GGSCI> ADD REPLICAT REPSURESH, INTEGRATED, EXTTRAIL /u01/app/oracle/product/gg/dirdat/rs

GGSCI> EDIT PARAMS REPSURESH

Add the following lines to repsuresh.prm:

REPLICAT REPSURESH

SETENV (ORACLE\_SID=suresh)

USERID ogg\_linux, PASSWORD YourStrongPassword

ASSUMETARGETDEFS

MAP SCOTT.EMP, TARGET SCOTT.EMP;

Save and exit.

Target: MAHESH

GGSCI> ADD REPLICAT REPMAHESH, INTEGRATED, EXTTRAIL /u01/app/oracle/product/gg/dirdat/rm

GGSCI> EDIT PARAMS REPMAHESH

Add the following lines to repmahesh.prm:

REPLICAT REPMAHESH

SETENV (ORACLE\_SID=mahesh)

USERID ogg\_linux, PASSWORD YourStrongPassword

ASSUMETARGETDEFS

MAP SCOTT.EMP, TARGET SCOTT.EMP;

Save and exit.

4. Initial Load Strategy

Before starting the change synchronization, you need to load the existing data from scott.emp on proddb to scott.emp on KRUPA, suresh, and mahesh. A common approach is using expdp/impdp or GoldenGate's own initial load capabilities.

Here, we'll outline a simple expdp/impdp method. Repeat for each target.

Export scott.emp from Source (proddb - Windows Command Prompt):

expdp ogg\_windows/YourStrongPassword@proddb DUMPFILE=emp.dmp LOGFILE=emp\_exp.log TABLES=scott.emp

This will create emp.dmp in your DATA\_PUMP\_DIR (check SELECT \* FROM DBA\_DIRECTORIES WHERE DIRECTORY\_NAME = 'DATA\_PUMP\_DIR'; in SQL\*Plus). Copy this file to each Linux target server.

Import scott.emp to Target (KRUPA, suresh, mahesh - Linux Command Prompt):

On each target server, ensure the emp.dmp file is in a directory accessible by Oracle (e.g., in a new DATA\_PUMP\_DIR if needed, or temporarily copy to /tmp).

If the table exists, you might want to truncate it first: TRUNCATE TABLE scott.emp; (be very careful with this in production environments).

-- Example for KRUPA database

impdp ogg\_linux/YourStrongPassword@KRUPA DUMPFILE=emp.dmp LOGFILE=emp\_imp\_krupa.log TABLES=scott.emp TABLE\_EXISTS\_ACTION=REPLACE

-- Repeat for suresh and mahesh, changing the database name in the connect string

5. Starting GoldenGate Processes

Once the initial load is complete and verified, you can start the GoldenGate processes.

5.1 On Source (Windows)

GGSCI> START EXTPRODDB

GGSCI> START PUMPKRUPA

GGSCI> START PUMPSURESH

GGSCI> START PUMPMAHESH

GGSCI> INFO ALL

5.2 On each Target (Linux)

GGSCI> START REPKRUPA -- For KRUPA target

GGSCI> START REPSURESH -- For SURESH target

GGSCI> START REPMAHESH -- For MAHESH target

GGSCI> INFO ALL

6. Verification and Monitoring

Check Status: Use INFO ALL or STATUS <process\_name> in GGSCI to check the status of your processes.

View Reports: Use VIEW REPORT <process\_name> to check process logs for errors or important messages.

Lag Reports: SEND EXTRACT <extract\_name>, REPORT and SEND REPLICAT <replicat\_name>, REPORT for detailed lag information.

Insert/Update/Delete on Source: Perform some DML operations on scott.emp on proddb and verify that the changes appear on KRUPA, suresh, and mahesh databases.

Important Notes:

Passwords: Replace YourStrongPassword with actual strong passwords.

IP Addresses: Replace <IP\_OF\_KRUPA\_SERVER>, <IP\_OF\_SURESH\_SERVER>, <IP\_OF\_MAHESH\_SERVER> with the actual IP addresses or hostnames of your Linux target servers.

Error Handling: Monitor GoldenGate report files and database alert logs for any errors.

Security: In a production environment, GoldenGate best practices recommend hardening security (e.g., network encryption, secure parameter storage).

Integrated Processes: This configuration uses Integrated Extract and Integrated Replicat, which are recommended for modern Oracle databases (11.2.0.4+ and 12c+ respectively) as they leverage the database's logmining server for better performance and easier management.

Character Sets: Ensure character sets are compatible between source and target databases to avoid data corruption.

Underscores in SETENV: For ORACLE\_SID in SETENV, use underscores.

Case Sensitivity: Be mindful of case sensitivity for paths and database names on Linux.

Directory Permissions: Ensure the ogg\_linux OS user has read/write permissions to /u01/app/oracle/product/gg/dirdat on the target servers.